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Case report

Fatal crocodile attack

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ABSTRACT

Attacks on human beings by various animals leading to varied types of injuries and even death in some cases are not uncommon. Crocodile attacks on humans have been reported from a number of countries across the globe. Deaths in such attacks are mostly due to mechanical injuries or drowning. Bites by the crocodiles often cause the limbs to be separated from the body. The present case refers to an incident of a fatal attack by a crocodile on a 35 years old female where only the mutilated head of the female was recovered. Multiple lacerated wounds over the face and scalp along with fracture of the cranial bones was detected on autopsy. Two distinct bite marks in the form of punched in holes were noted over the parietal and frontal bones. Injuries on the head with its traumatic amputation from the body were sufficient to cause death. However, the presence of other fatal injuries on the unrecovered body parts could not be ruled out.

1. Introduction

Human fatalities due to wild animal attacks have been reported world wide. Deforestation, encroachment of human civilization into forests and wide spread tourism development programme into restricted areas of wild animal habitats have altered the balance of the ecosystem. Bites on humans by wild animals are usually the result of self defense by the animal or the victims being prey to them for their food. Among the different types of animal bites, snake bites are by far the commonest. In the Sundarban region of West Bengal, India and Bangladesh,[1] tiger bites have been reported infrequently which are mostly fatal. Unusual bites by wild boar,[2,3] bear[4]; camel[5] and donkey[6] have also been reported. In the United States from 1948 to 2004, 376 cases of alligator bites have been reported.[7] Unlike the alligators, the salt water crocodiles (*Crocodylus porosus*) also known as estuarine are found in Northern Australia, South East Asia and the Eastern coast of India.[8] Estuarines' also cause human injuries. We report a case of a fatal attack by a crocodile in which only the mutilated head of the victim could be recovered with distinct bite marks.

2. Case report

A 35 years old female along with four villagers went to a river in the forest at the early hours of the morning to catch fish for their livelihood. As per statements of eye witnesses she was sitting on a raft with her feet dipped into the water. Suddenly a crocodile attacked her, grasped her by the right thigh and pulled her under water on a "death roll". Efforts to rescue her were in vain and the villagers reported the matter to the local authority. The same evening a mutilated head of a female subject (Fig. 1) was found on the river bank 1.5 km down stream from the place of occurrence. It was identified by the family members to be of the missing female victim.

On autopsy, multiple lacerated wounds were found on the scalp and face with fracture of the nasal bone and right maxilla. The mandible on the right side was partially missing. The base of the skull on the posterior aspect was fractured and part of the occipital bone was missing. A circular depressed fracture, of 2 cm diameter and clean, well defined margins with punched in appearance was noted on the posterior aspect of the right side parietal bone close to the sagital suture (Fig. 2). Another punched in circular depressed fracture, with a diameter of 1.4 cm was found on the left side of the frontal bone 7 cm above the left supra orbital margin. (Fig. 3). The brain was lacerated through the perforated meninges.

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Fig. 1. Mutilated head of the deceased.

3. Discussion

Estuarines are the largest variety of crocodiles in India. These predators have a unique method of capturing and killing their prey. They grip their victims with their massive strong jaws; drag them under water in a spinning manner (death roll) to put their prey off balance. Death usually results from the crushing injuries and hemorrhage or as a result of drowning. The fortunate ones who are able to survive the initial assault may suffer from various complications including infections and sepsis due to aerobic, anaerobic and fungal species.[9–12] Unlike other reptilian bites like snakes and Gila monsters[13–15] where features of anaphylaxis or evnenomation may be found, mechanical injuries are the predominant cause of death in case of crocodile bite. Mekisic[11] is of the opinion that deaths are mostly due to transection of the torso or decapitation. Langley[16] in his study has reported that human injuries from alligator attacks may range from scratches and punctures to amputations and death. In a study of animal related injuries conducted in Tanzania, limb amputations were found in 2.2% cases which were mostly due to large, wild and aquatic animals.[17] Caldicott et al.[18] has reviewed in detail the possible injuries from crocodile attacks while Gruen[19] has stressed on the pre hospital care and the surgical management of unfortunate victims.

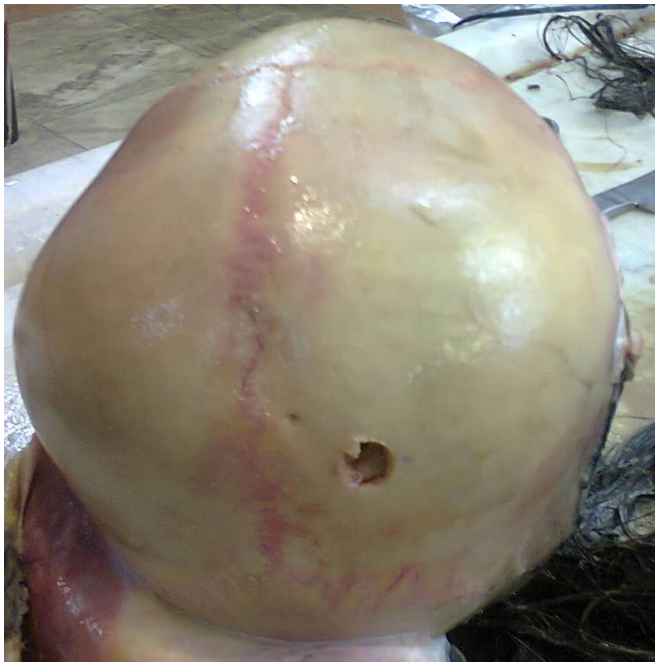

Fig. 2. Bite mark on the parietal bone.

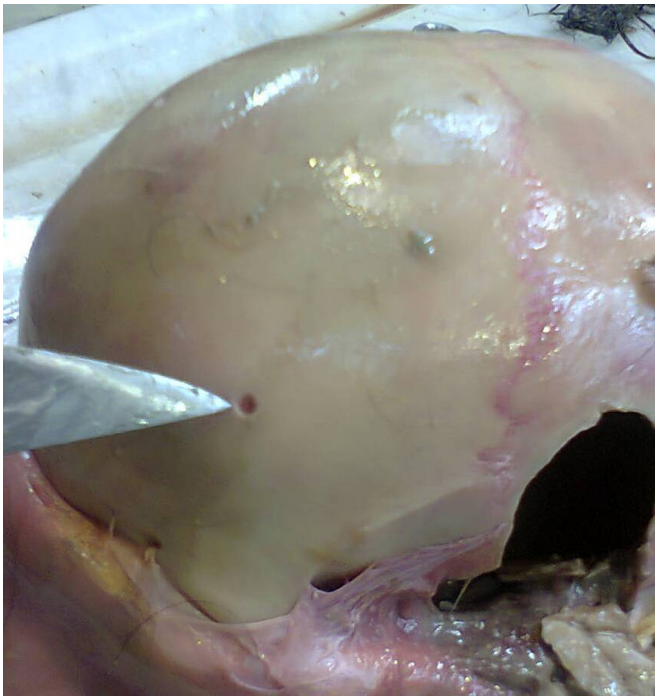

Fig. 3. Bite mark on the left side of frontal bone.

In the present case the bite marks on the skull in the form of punched in depressed fractures, lacerations of the underlying meninges and brain with evidence of traumatic amputation of the head was sufficient to cause death. However, since only the head was recovered in a mutilated state, hence the possibility of other fatal injuries on the unrecovered body parts could not be ruled out. Emani et al.[20] reported a case of survival despite obvious penetration of the skull by a tiger's canine. Clamping of the head in between the two sets of canines is important for a firm grip and penetration into the cranial cavity in case of a tiger. On the other hand the wide space of a completely open mouth and the multiple numbers of teeth in case of a crocodile facilitates a better grip and a forceful bite. Tedeschi – Oliveira[21] have analyzed bite marks of humans and dogs on the basis of their-inter canine distance. However, such data are unavailable for other carnivorous animals or crocodile bite marks. In the present case the bite marks on the vault of the skull were well defined punched in holes without any evidence of radiating or fissure fractures. Bury[22] has reported that in case of injuries from large aquatic animals like alligators and sharks a significant component of crushing may be present. Surprisingly no crushing effect was noted on the vault of the skull in the present case. This may be due to the fact that the sudden, forceful impact of the bite occurred in such a manner that the maximum force was applied perpendicular to the surface of the skull at the point of impact and only the tip of the teeth were in contact with the cranial bones. Thus the force of the bite was restricted only to the point of contact on the skull, minimizing the distribution of force over a wider area with no crushing effect. In

the absence of circumstantial evidences, such typical appearance of bite marks may be misinterpreted as mechanical injuries due to penetrating foreign bodies likes bullets. Bury[22] has also emphasized that blunt or sharp trauma from animal activity may be confused with postmortem damage or with inflicted injury from an assault.

4. Conclusion

Decapitation, amputations and punctured wounds due to bites over the vital structures are the major cause of deaths in crocodile attacks. Careful examination of the bite marks is essential to exclude the other possible manner of injuries and to arrive at a conclusive opinion. Minimizing encroachment into animal habitat, strict vigilance and knowledge of crocodile behavior would reduce such human crocodile conflicts. Precautionary measures by the villagers in the form of avoiding water bodies and routes inhabited by crocodiles and trained guides to enter forests would be helpful to prevent the unfortunate loss of human life in future.

Ethical approval

None.

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None.

Conflict of interest

The authors state that they have no conflict of interest in relation to the present study.

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